

SAFETY

- ☐ SAF/ESR Only tasks and materials described on the SAF or ESR are allowed.
- ☐ Restricted Use Only GHS Authorized Staff can operate the gas cabinets, gas cylinder racks, system supply gas and the emergency shutdown panel.
- ☐ PPE Safety glasses are required for connecting/disconnecting compressed gas cylinders to/from the installed gas delivery system. Safety shoes are recommended but not required.
- ☐ GHS Status Locate and discuss the signs by the light towers. Red-Alarm, Yellow-Warn, Green-Operational.
- ☐ Emergencies Should a hazardous gas release, fire, or other dangerous situation occur, press the EMERGENCY STOP button and leave the area. Locate and discuss GHS assembly areas and when to call x2222 (emergency), or x2550 (non-emergency).
- ☐ Malfunctions Gas equipment that is not functioning properly should be shutdown immediately and not operated until it can be properly repaired.
- ☐ Hazardous Gas Use During hazardous gas use, at least one (1) GHS Authorized Staff must be present unless otherwise specified by ESH or the GHS SME.
- ☐ CGA Fittings Only authorized personnel can change out CGA fittings. Do not attempt to do so without prior approval.

SYSTEM SUPPLY GAS

- ☐ Pneumatic & Venturi Vacuum Generator Nitrogen (N₂) or Clean Dry Air (CDA) , filtered to <10um. This will supply both the pneumatic actuated valves and the venturi vacuum assist. The regulator should read 85-95psig to function properly. Too high/low a pressure will cause the venturi to not operate/pneumatic valves to not actuate.
- ☐ Purge Gas Inert purge gas typically N₂, Ar, He, Xe or Kr filtered to 0.01um, 99.9999% pure; Functions at 85-95 psig.

GAS CABINETS

- ☐ Authorized Gas Use The cabinets are designed to handle flammable/toxic gases. DO NOT CONNECT any gas that is not on the SAF/ESR or has not been approved by ESH.
- ☐ Authorized Access Cabinet doors and cabinet windows both have locks. The door should only be opened when changing gas cylinders or performing maintenance activities. Use window for all valve actuations.
- ☐ System Controller Emergency Shutdown System (ESS) Controller is semi-automatic controller and Hazardous Production Materials (HPM) II Controller is a fully automatic controller. Follow flowchart or work instructions to operate.
- ☐ Operation Modes 3 modes: Manual, Purge, Run (depending on the cabinet selected).
- ☐ Manual Mode Operation of the pneumatic actuated valves in manual mode has inherent safety concerns. Only GHS Authorized Staff/SME may do so.
- ☐ Gas Cylinder Change-Out Follow the appropriate work instruction to change out a compressed gas cylinder. Contact ESH or GHS SME if toxic compressed gas cylinder.
- ☐ Cabinet Safety Cabinets have toxic/flammable gas sensors, rate of rise sensors and low exhaust flow sensors. Locate and discuss.
- ☐ Rate-of-Rise Detects rapid temp change of 15F (9C) per minute which will activate rate-of-rise alarm (will reset without replacement); Detects fixed temp of 135F (57C) alarm must be replaced if fixed temp disk falls free from unit.
- ☐ Toxic/Flammable Gas Detector Sensors Show locations and discuss. TGD has two set points, a warning level and an alarm level, specific for each gas being sensed. Both levels will illicit a red visible alarm, however, the higher alarm level also has an audible alarm.
- ☐ Exhaust Low exhaust flow will emit an alarm of no lights, but system gas will still flow.

GAS CYLINDER RACKS

- ☐ Purge Gas Locate and discuss use. 2-valve manual manifold. To change a gas cylinder, follow the gas cylinder change-out work instruction.
- ☐ Process Gas Locate and discuss use. 3-valve manual manifold. To change a gas cylinder, follow the gas cylinder change-out work instruction.

OTHERS

- ☐ Manifold Components Locate and discuss: Overpressure relief valve, pneumatic valve, manual valve, vacuum assist valve, pressure gauge, pigtail, CGA fitting, excess flow switch, check valves.
- ☐ Operating Pressure System delivery operating pressure range: 01-100 psig.
- ☐ Emergency Shutdown Panel (ESP) Description and locations(s); Safety system that monitors the gas detection system, exhaust pressure sensors, rate of rise sensors and EMO buttons.

<input type="checkbox"/> Programmable Logic Controller (PLC)	Allows access to all component displays to operate and monitor their functioning status. Do not operate unless authorized. Three operational modes: Stop, EPICS, and Manual.
<input type="checkbox"/> Mass Flow Controller (MFC)	Controlled via PLC; Delivery flow range (0 to 500 sccm) with N2. Gas conversion factors needed for other gases. Do not operate unless authorized.
<input type="checkbox"/> Thermoelectric Bath (Bubbler)	Temperature controlled water baths that allow for connection of a bubbler to the system. Controlled via the PLC. Alarms of which will be communicated to the PLC (e.g. deviation, low water flow, and cut out alarm).
<input type="checkbox"/> Bath Liquid	Distilled or clean water (5-60°C), orethyleneglycol/watermix with ethyleneglycol under 50% concentration (0-60°C).
<input type="checkbox"/> Fast Switch Bypass Valve	Allows rapid switching of one source gas to another source gas.

(1) Provide training for each check-box to each lab user. If a check-box does not apply, cross out that line. User must be listed on the SAF and/or ESR. Complete information below. Training is valid for 1 year for this lab only. (2) Send completed forms to NSLS-II Training, **Building 745 C09U**, immediately after all users listed on the SAF (who plan to use this lab) have been trained. Training will be entered in the user's training history.